

## REMARKS

### Summary of Examiner Interview

Applicant thanks Examiner Robert W. Hodge for the telephonic interview conducted on 6/11/2009. The Applicant was represented by Mr. Denis Maloney, the undersigned, and Mr. Indranil Sarkar who is assisting the undersigned.

Applicant's representatives discussed with the examiner proposed amendments to claim 1. On request from the examiner, the Applicant's representatives pointed out support for the proposed amendments in the specification. The examiner seemed to be satisfied with the support shown and agreed that the proposed amendments would overcome the prior art of record.

Applicant's representatives then discussed proposed amendments to claim 12. The Examiner again asked the Applicant's representatives to point out support for the proposed amendments in the specification. The examiner also agreed that if adequate support can be shown then the proposed amendments would overcome the prior art of record. Applicant has modified the amendments proposed for claim 12 in light of the discussion with the examiner.

### 35 U.S.C § 102

The examiner rejected claims 1 and 9-11 under 35. U.S.C. 102(e) as being anticipated by Gore (US 2004/0202904).

The Examiner states:

**As seen in figures 2 and 2A-2C, Gore teaches a fuel cartridge 206 having a housing 230, a heat producing element (i.e. wire) 208, disposed in the cartridge and in thermal communication with the cartridge and spacing a vapor portion from a liquid portion (paragraphs [0039]-[0051]).**

Without conceding the Examiner's position, Applicant has amended claim 1 to recite "...a heat producing element disposed in the fuel egress port." Applicant submits Gore does not disclose or suggest a heat producing element disposed in the fuel egress port. Rather, Gore

describes an electrical heating element in a fuel cartridge that heats a fuel strip when the strip is brought within a certain distance from the element. As described by Gore:

The fuel cartridge 206 also includes an electric heating element 208. As depicted in FIGS. 2A-2C, the electric heating element 208 is assumed to be defined by (i.e., includes, or is formed by) a resistor.<sup>1</sup>

...

The film guide 264 is further configured to guide a usable portion 268 of the film strip 210 generally away from the supply reel 246 and to support the usable portion 268 in cooperative (i.e., usable, or heat-able) adjacency with the electric heating element 208. In this way, the electric heating element 208 can be used to liberate hydrogen gas from the fuel compound 270 of the usable portion 268 of the film strip 210.<sup>2</sup>

Gore does not suggest, much less disclose, the heat producing element to be disposed in a fuel egress port. The gas vents described by Gore merely allow fluid coupling of the fuel cartridge with a fuel cell and does not disclose or suggest the heating element to be disposed in such vents. The examiner, in the telephonic interview conducted on 06/11/2009 agreed that the proposed amendments would overcome the prior art of record. Independent claim 1, as amended, is therefore patentable over Gore for at least the foregoing reasons.

Dependent claims 9-11 are patentable for at least the reasons mentioned with respect to claim 1.

#### 35 U.S.C § 103

The Examiner rejected claims 1 and 8-11 as being unpatentable over Yonetsu (U.S. Patent No. 6,506,513) in view of Gore. The Examiner agrees that Yonetsu does not teach a heat producing element and relies on Gore for that purpose. As stated by the Examiner:

**Yonetsu does not teach a heat producing element.  
Gore as discussed above is incorporated herein.  
At the time of the invention it would have been obvious to one having ordinary skill in the art to provide a heat-producing element in the fuel cartridge of Yonetsu as taught by Gore in order to vaporize the methanol in the cartridge before entering the direct methanol fuel cell of Yonetsu so that the rate of reaction can be accelerated in the direct methanol fuel cell of Yonetsu thus increasing the overall efficiency of the cartridge and fuel cell system of Yonetsu.**

<sup>1</sup> Gore, at paragraph [0051]

<sup>2</sup> Id.,at paragraph [0053]

Applicant disagrees. First, there is no motivation for one of ordinary skill in the art to dispose a heating element, as described by Gore, in the fuel egress port of Yonetsu. In contrast, in its background section, Yonetsu categorically states that vapor feed type fuel cells are complex and necessitates using auxiliary machines.

The fuel cell of the conventional vapor feed type makes it possible to use directly a liquid fuel of a high concentration and, thus, is advantageous in terms of miniaturization of the fuel section. However, since the system is complex, it is necessary to use auxiliary machines, making it difficult to miniaturize the fuel cell as it is.<sup>3</sup>

In the summary section, Yonetsu goes on to state that the invention attempts to overcome the problems noted in the background section by supplying *liquid* fuel with high stability. As described by Yonetsu:

An object of the present invention, which has been achieved in an attempt to overcome the above-noted problems inherent in the conventional fuel cell-so as to provide a small fuel cell useful as a battery for a small equipment, is to provide a highly reliable fuel cell, which permits simplifying the liquid fuel supply system, which permits supplying a liquid fuel with a high stability, and which is stable in its output.<sup>4</sup>

For at least the above reasons, Applicant disagrees with the Examiner that the motivation to combine Gore with Yonetsu is that the “**the rate of reaction can be accelerated in the direct methanol fuel cell of Yonetsu thus increasing the overall efficiency of the cartridge and fuel cell system of Yonetsu.**” As demonstrated by the paragraphs quoted, Yonetsu clearly does not disclose or suggest using vapor feed type fuel cells.

Second, assuming *arguendo* that Gore is properly combined with Yonetsu, , such a combination would fail to disclose or suggest a heat producing element disposed in the fuel egress port, as recited and arranged in amended claim 1. As mentioned above, Gore does not disclose or suggest a heat producing element disposed in the fuel egress port. Rather the electrical heating element, as disclosed by Gore, is in the cartridge and used to heat a solid film strip that must be brought within a cooperative adjacency with the heating element. Gore does

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<sup>3</sup> Yonetsu, Col. 1, lines 19-24

<sup>4</sup> Id., Col. 2, lines 33-40

not suggest, much less disclose, the heating element is disposed in a fuel egress port. Yonetsu fails to cure this deficiency.

Claim 1, as amended, is therefore patentable over Yonetsu and Gore, taken either alone or in combination. Dependent claims 8-11 are patentable for at least the reasons for which claim 1 is patentable.

The Examiner rejected claim 12 under 35 U.S.C. 103(a) as being unpatentable over Yonetsu. The Examiner states:

As seen in the figures, Yonetsu teaches a fuel cartridge, that is prismatic in shape, having a housing 1, a fuel egress port 12, a bladder 16 (figure 7B) that holds a liquid fuel 7 such as methanol (column 5, lines 4-8) that is supplied to a direct methanol fuel cell 2 (column 2, line 34 - column 3, line 19, column 4, line 26 - column 5, line 14 and column 7, line 47 - column 7 line 62).

...  
Yonetsu does not teach the piston and the bladder in the same embodiment.

At the time of the invention it would have been obvious to one having ordinary skill in the art to combine the embodiments of figures 7A and 7B of Yonetsu in order to provide a fuel cartridge with multiple solutions for properly containing the methanol fuel as well as providing sufficient means to push out the fuel through the fuel outlet port thereby providing the necessary fuel to the fuel cell in order for the fuel cell to operate.

Without conceding the Examiner's position, Applicant has amended claim 12 to recite "a fuel egress port supported by the housing configured to pass fuel in vapor phase" and "a heat producing element disposed in the fuel egress port."

Support for the above amendment can be found at least in **page 10, line 19 of the Applicant's specification, FIG. 4, and original claim 13**. Applicant contends that Yonetsu does not disclose or suggest at least the foregoing features of amended claim 12.

As mentioned above with respect to claim 1, Yonetsu is directed to liquid fuel supply systems. As shown at least in FIG. 7A and 7B of Yonetsu, fuel in liquid form is pushed out of the fuel outlet port. Yonetsu describes:

Specifically, in the liquid fuel tank shown in FIG. 7A, a fuel sealing part 30 is pushed by a spring 14, and the liquid fuel 7 is pushed out through the

fuel outlet port 12. In the fuel tank shown in FIG. 7B, the liquid fuel 7 is housed in a bellows-shaped storage section 16 and pushed out through the fuel outlet port 12 by the function of the storage section itself.

Indeed, Yonetsu is directed specifically to liquid fuel delivery systems and therefore does not suggest, much less disclose, "a fuel egress port supported by the housing configured to pass fuel in vapor phase." Nor would Yonetsu suggest a heat producing element disposed in the fuel egress port.

In the Advisory Action dated 07/01/2009, the Examiner stated:

**As was discussed in the telephone interview on 6/18/09 the Examiner expressed that it appears that claim 12 now contains new matter because it does not appear that the embodiment that claim 12 reads on can contain a bladder, this issue has not been addressed in applicants response.**

Applicant points out to the examiner that the proposed amendments to claim 12 discussed during the interview were modified . Claim 12, as amended, recited the fuel egress port feature and not the piston feature that was discussed. The support for this feature was set forth by Applicant in the prior reply as now indicated by **bold** typeface, as shown above. By way of example, claim 12, as amended, is clearly supported at least by FIG. 4 and its accompanying discussion that shows a fuel cartridge including a bladder, a piston urged against the bladder and a fuel egress port 32 that is configured to pass methanol in vapor phase. The Specification, at least in page 10, line 19, further describes the egress port 32 as: "The egress port 32 can have a fuel valve integrated with a vaporization heating unit." Therefore, Claim 12, as amended, does not contain any new matter as speculated by the examiner.

Claim 12, as amended, is therefore patentable over Yonetsu. Dependent claims 13-17 are patentable for at least the reasons mentioned with respect to claim 12.

#### Double Patenting

The Examiner provisionally rejected claims 1, 8, 12 and 17 on the ground of double patenting as follows:

**Claims 1, 8, 12 and 17 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 11 and 12 of copending Application No. 10/644,818.**

Application No. 10/644,818, as cited by the Examiner, is not a related application. It is assumed the Examiner meant to refer to co-pending Application No. 10/664,818.

Applicant submits that amended claims 1 and 12 are patentably distinct from claims 11 and 12 of co-pending Application No. 10/664,818. The Examiner contends:

**Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of copending Application No. 10/644,818 fully encompass the scope of instant claims the only difference is claim 12 provides further structure for the storage of the fuel which has been found in the prior art.**

Applicant disagrees. Neither claim 11 nor claim 12 of co-pending Application No. 10/664,818 includes a heat producing element disposed in the fuel egress port, as recited in amended claims 1 and 12. The examiner agreed in the telephonic interview conducted on 6/11/2009 that the prior art of record does not disclose or suggest at least this feature. Claims 11 and 12 of Application No. 10/664,818 also do not include a bladder or piston as recited in independent claim 12.

Claims 8 and 17 are patentably distinct from claims 11 and 12 of co-pending Application No. 10/664,818 at least for the reasons mentioned with respect to claims 1 and 12 of the instant application.

The Examiner further rejected claims 1, 8, 12 and 17 on the ground of double patenting as:

**Claims 1, 8, 12 and 17 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-8 and 10 of copending Application No. 10/664,822.**

Claims 1-8 and 10 has been canceled in the co-pending application 10/664,822. This rejection is therefore moot.

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Serial No. : 10/664,405  
Filed : September 16, 2003  
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Attorney's Docket No.: 08935-0299001 / M-5033/Z-  
03461

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Respectfully submitted,

Date: July 6, 2009

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